4280

AP/12

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE REISSUE APPLICATION OF: J. T. LIN :

: GROUP: 3739

SERIAL NO: 09/084,441 :

FILED: May 27, 1998 : EXAMINER: MICHAEL PEFFLEY

FOR: OPHTHALMIC SURGERY METHOD USING NON-CONTACT SCANNING LASER

RECEIVED
FEB 03 2000
OFFICE OF PETITIONS
DEPUTY A/C PATENTS

37 CFR 1.291 Public Protest

09084441

RECEIVED
JAN 24 2000
TECHNOLOGY CENTER 3700

Table of Contents

I. **37 CFR 1.291(a) Preamble**

This is a public protest against the application identified above. That application is purported to presently be examined in Group 3739.

II. **37 CFR 1.291(a)(1) and MPEP 1901.04, Third Paragraph**

The protest is timely because the application identified above has not received a notice of allowance. See MPEP1441 stating that "[o]nce the first Office action is mailed. . . , a member of the public may still submit pertinent information in the form of a protest under 37 CFR 1.291(a), and the examiner will consider the information submitted in the next Office action, to the extent that such consideration is appropriate."

III. **37 CFR 1.291(a)(2)**

As indicated by the certificate of service accompanying this protest, a copy of this protest and all of the items submitted with the protest are being served upon the applicants, in accordance with 37 CFR 1.248.

IV. **37 CFR 1.291(b) - Substantive Basis for the Protest**

Submitted herewith are (1) attachment 1 explaining why the claims in the Lin reissue application are unpatentable and (2) the numbered prior art exhibits identified below.

A. **List of Attachments**

Submitted herewith is the following attachment:

Attachment 1: Explanations of why certain prior art anticipates and certain combinations of prior art render obvious claims in the Lin reissue application.

B. **37 CFR 1.291(b)(1) The List of Patents, Publications, and Other Information Relied Upon**

Reference 1: United States patent No. 4,538,608 to L'Esperance, Jr., issued September 3, 1985.

Reference 2: United States patent No. 4,838,679 to Bille, issued June 13, 1989.

Reference 3: United States patent No. 5,507,799 to Sumiya, issued April 16, 1996, claiming priority to S.N. 812,819 filed December 24, 1991.

Reference 4: Hanna et al., "Scanning Slit Delivery System," J. Cataract. Refract. Surg., Vol. 15, (July 1989).

Reference 5: United States patent No. 4,718,418 to L'Esperance, Jr., issued January 12, 1988.

Reference 6: United States patent No. 4,665,913 to L'Esperance, Jr., issued May 19, 1987.

Reference 7: United States patent No. 4,941,093 to Marshall et al., issued July 10, 1990.

Reference 8: United States patent No. 5,152,759 to Parel et al., issued October 6, 1992, filed June 7, 1989.

C. **37 CFR 1.291(b)(2) A Concise Statement of the Relevance of Each Reference**

1. **Reference 1: United States patent No. 4,538,608 to L'Esperance, Jr., issued September 3, 1985**

The L'Esperance '608 patent is relevant because (1) it is directed toward the field of laser ablation for ophthalmic surgery, (2) it teaches applying a laser beam onto the cornea, (3) it teaches pulsing a laser beam at a repetition rate from about 20 Hz to about 500 Hz, (4) it inherently teaches scanning the laser beam in a substantially overlapping pattern on the cornea, (5) it discloses a laser beam with an energy of about 1 to about 30 millijoules per pulse, (6) it discloses a near-infrared, an ultraviolet laser beam, an excimer and a Nd-YAG laser, (6) it discloses a scanner configured to scan the laser beam over the cornea, and (7) it discloses a visible aiming device to guide the laser beam.

The teachings of the U.S. patent No. 4,538,608 to L'Esperance, Jr. are 35 USC 102(b) non-antedatable prior art to the claims in the Lin reissue application.

The L'Esperance '608 patent anticipates claims 24, 25, 27, 34, 37, 39, 42, 43, 46, 69, 71, 75, 91 and 93 of the Lin reissue application.

Claims 31, 33, 48, 50, 51, 55, 56, 65, 67, 68, 73, 74, 92 and 96 would have been obvious to one of ordinary skill in the art based upon the system and method disclosed in the L'Esperance '608 patent in view of the additional teachings in the reference identified as number 2 in the protest and in view of what is well known in the art.

2. **Reference 2: United States patent No. 4,838,679 to Bille, issued June 13, 1989**

The Bille '893 patent is relevant because (1) it is directed toward the field of laser scanning for eye examinations, in particular corneal examination, and (2) it describes a laser

scanning mechanism including a galvanometer with pivotal mirrors configured to deflect the laser beam at predetermined angles.

The teachings of the U.S. patent No. 4,838,679 to Bille are 35 USC 102(b) non-antedatable prior art to the claims in the Lin reissue application.

3. Reference 3: United States patent No. 5,507,799 to Sumiya, issued April 16, 1996, claiming priority to S.N. 812,819 filed December 24, 1991

The Sumiya '799 patent is relevant because (1) it is directed toward the field of laser ablation for ophthalmic surgery, in particular ablation of the cornea (2) it discloses a laser beam repetition rate of "about 20 to 50 Hz," (3) it teaches substantial overlapping of the scanning patterns and of consecutive laser beam pulses, (4) it discloses an ultraviolet laser beam, an excimer laser, (5) it teaches controlling the scanning pattern by computer, (6) it teaches synchronization of the laser pulses and the laser beam scanning, and (7) it teaches a smooth ablation as a result of overlapping consecutive pulses.

The teachings of the U.S. patent No. 5,507,799 to Sumiya are 35 USC 102(e) prior art to the claims in the Lin reissue application.

Claims 24, 25, 27-29, 32, 34-36, 39-45, 48, 50, 51, 55-60, 62-64, 69, 71, 72, 75-78, 80-91, 93, 94, 97-98, would have been obvious to one of ordinary skill in the art based upon the system and method disclosed in the Sumiya '799 patent in view of the additional teachings in references identified as number 2, 5 and 6 in the protest and in view of what is well known in the art.

4. Reference 4: Hanna et al., "Scanning Slit Delivery System," J. Cataract. Refract. Surg., Vol. 15, (July 1989)

The 1989 Hanna et al. publication is relevant because (1) it is directed toward the field

of laser ablation for ophthalmic surgery, and in particular corneal surgery, (2) it discloses an excimer laser with a laser beam at 193 nm, (3) it inherently teaches synchronization between the scanning and the pulsing of the laser beam, (4) it teaches linear scans, circular scans, concentric circles scans, (5) it discloses an alignment device, and (6) it teaches overlapping scanning patterns.

The publication is dated July 1989. Therefore its teachings are 35 USC 102(b) non-antedatable prior art to the claims in the Lin reissue application.

Claims 24, 25, 27-29, 32-48, 50, 51, 53-60, 62-69, 71-94, and 96-98 would have been obvious to one of ordinary skill in the art based upon the system and method disclosed in the Hanna et al publication in view of the additional teachings in references identified as number 2, 5 and 6 in the protest and in view of what is well known in the art.

5. Reference 5: United States patent No. 4,718,418 to L'Esperance, Jr., issued January 12, 1988

The L'Esperance '418 patent is relevant because (1) it is directed toward the field of laser ablation for ophthalmic surgery, (2) it teaches controlled laser beam scanning to correct myopic and hyperopic conditions, astigmatism, (3) it teaches performing radial or other incisions for keratotomy procedures, (4) it inherently teaches overlapping of the laser beam pulses during a scanning procedure, (5) it explicitly teaches computer programmed control of the scans, (6) it discloses using a laser at a pulse repetition of 200 Hz, providing a beam spot having a dimension of 0.5 mm, and providing laser pulses having a duration of 15 ns, (7) it teaches controlling the irradiated flux density and exposure time to achieve desired depth of the ablation and desired ultimate surface change in the cornea, (8) it discloses scanning a laser beam from a laser emitting a pulse in the ultraviolet range, and it discloses gas-lasers such as

xenon-fluoride, nitrogen, xenon-chloride, krypton-fluoride, argon-fluoride, fluorine lasers and other lasers, including crystal lasers and laser-pumped lasers as alternative laser pulse sources, and (9) it teaches linear, circular, radial and concentric circle scan patterns produced by pulsing a laser beam spot on the surface of the eye.

The teachings of the U.S. patent No. 4,718,418 to L'Esperance, Jr. are 35 USC 102(b) non-antedatable prior art to the claims in the Lin reissue application.

6. Reference 6: United States patent No. 4,665,913 to L'Esperance, Jr., issued May 19, 1987

The L'Esperance '913 patent is relevant because (1) it is directed toward the field of laser ablation for ophthalmic surgery, (2) it describes controlled laser scanning (a) to correct myopic and hyperopic conditions, astigmatism and (b) to perform incisions of a radial or other keratotomy, (3) it inherently teaches overlapping of the beam spot in different pulses to achieve the desired ablation depth, (4) it teaches computer program controlled scans, (5) it teaches providing laser beam pulses at a repetition of 200 Hz, a laser beam spot dimension of 0.5 mm, and a pulse duration of 15 ns, (6) it teaches controlling the irradiated flux density and exposure time to achieve desired depth of the ablation and desired ultimate surface change in the cornea, (7) it teaches using a scanning laser emitting in the ultraviolet range, such as a gas-lasers including xenon-fluoride, nitrogen, xenon-chloride, krypton-fluoride, argon-fluoride, fluorine gas lasers, and other lasers including crystal lasers and laser-pumped lasers as alternative sources, and (8) it teaches linear, circular, radial and concentric circle scan patterns produced by pulsing a laser beam spot on the surface of the eye.

The teachings of the U.S. patent No. 4,665,913 to L'Esperance, Jr. are 35 USC 102(b) non-antedatable prior art to the claims in the Lin reissue application.

7. **Reference 7: United States patent No. 4,941,093 to Marshall et al., issued July 10, 1990**

The Marshall et al '093 patent is relevant because (1) it is directed toward the field of laser ablation for ophthalmic surgery, in particular corneal ablation, (2) it teaches threshold values for corneal ablation, and (3) it teaches typical corneal ablation rates.

The teachings of the U.S. patent No. 4,941,093 to Marshall et al are 35 USC 102(b) non-antedatable prior art to the claims in the Lin reissue application.

8. **Reference 8: United States patent No. 5,152,759 to Parel et al., issued October 6, 1992, filed June 7, 1989**

The Parel et al '759 patent is relevant because (1) it is directed toward the field of laser ophthalmic surgery, in particular corneal surgery, (2) it teaches performing heat-shrinking of corneal tissue with a laser beam, i.e. photocoagulation, (3) it discloses an infrared laser with a wavelength of about 1.3-3.3 μm, (4) it discloses a Nd:YAG laser, and (5) it teaches scanning a laser beam on the cornea.

The teachings of the U.S. patent No. 5,152,759 to Parel et al are 35 USC 102(e) prior art to the claims in the Lin reissue application.

D. **37 CFR 1.291(b)(3) The Copy of Each Patent and Publication Relied Upon**

A copy of each patent and publication relied upon is being (1) filed with this paper and (2) served on the attorney of record for the Lin reissue application.

E. **The Claims in the Lin Reissue Application Are Unpatentable in View of the Prior Art**

Submitted herewith as Attachment 1 are explanations why certain prior art references anticipate certain claims and certain combinations of prior art references render certain claims obvious within the meaning of 35 USC 103.

V. **37 CFR 1.291(c)**

This protest complies with 37 CFR 1.291(c) because the references identified above as 1, 3, 4, 7 and 8 represent additional prior art.

VI. **37 CFR 1.56**

The protester directs the attention of the applicant to the requirements of the preamble of 37 CFR 1.56 and 37 CFR 1.56(a)(2). Accordingly, the applicant is advised to file a copy of this protest in all related applications in order to comply with 37 CFR 1.56.

Respectfully submitted

Benoit Castel

Benoit Castel, Esq.
Registration No. 35,041

CERTIFICATE OF SERVICE

This is to certify that one copy of this protest and each paper being filed with the protest is being served upon the attorney of record for J. T. Lin via next day delivery courier:

William H. Bollman
Farkas & Manelli, PLLC
2000 M Street, N.W., 7^{th} Floor
Washington, D.C. 20036-3307

January 24, 2000
DATE

Benoit Castel
Benoit Castel, Esq.
Registration No. 35,041

PROTEST OF 09/084,441

ATTACHMENT 1- UNPATENTABILITY OVER PRIOR ART

I. Introduction

This attachment gives in section II explanations of why certain references anticipate certain claims and in section III why certain combinations of references render certain claims obvious within the meaning of 35 USC 103. A table giving the relevant teachings of each prior art reference is given in section IV. Claim charts identifying the prior art teachings anticipating claims in the Lin reissue application are given in section V.

II. 35 USC 102 Anticipation

Claims 24, 25, 27, 34, 37, 39, 42, 43, 46, 69, 71, 75, 91 and 93 are anticipated by Reference 1: US 4,538,608 to L'Esperance: "Method and Apparatus for Removing Cataractous Lens Tissue." Claim chart V-A of section V at page 15 of this attachment shows that every element defined by these claims is disclosed in the L'Esperance '608 patent.

Claims 99-103 are anticipated by Reference 8: US 5,152,759 to Parel et al: "Noncontact Laser Microsurgical Apparatus." Claim chart V-B of section V at page 18 of this attachment shows that every element defined by these claims is disclosed in the Parel et al '759 patent.

III. 35 USC 103 Obviousness

The following combinations of references render obvious the following claims of the Lin reissue application:

A. Combination 1; reference 1 combined with reference 2 (the L'Esperance '608 patent combined with the Bille '679 patent).

Claims 48, 50, 51, 55, 56, 65, 67, 68 are obvious in view of combination 1: reference 1 combined with reference 2.

Reference 1 teaches all the limitations of the above claims except for a galvanometer. However, reference 1 teaches a scanner configured to scan the laser beam over the cornea (see column 3, lines 63-68 and figure. 2) and reference 2 teaches a galvanometer for controlling the scanning of a laser used for ophthalmic examinations (see figure 1 and column 5, lines 45-61). Furthermore, reference 2 teaches that the galvanometer allows a controlled X-Y scanning. See column 5, lines 45-61. It would have been obvious for one of ordinary skill in the art to control the laser scanning as taught in reference 1 using a galvanometer as taught in reference 2 in order to provide a controlled X-Y scanning of the laser beam on the

lens.

B. Combination 2; reference 1 combined with what is well known in the art.

Claims 31, 33, 73, 74, 92 and 96 are obvious in view of Combination 2: reference 1 combined with what is well known in the art.

Reference 1 teaches all the limitations of the above claims except for the specific wavelengths of the laser beam. However, these wavelengths are well known in the art. In particular, it is well known that an excimer laser can emit light at 193 nm, 222 nm, 248 nm, 308 nm, 337 nm, 351 nm, 10,600 nm. (See for example Trokel et al, Excimer Laser Surgery of the Cornea", American Journal of Ophthalmology", 12/1983, pp. 710-715.) Reference 1 states that an excimer laser may be used (see column 3, lines 7-9). Therefore, it would have been obvious for a person of ordinary skill in the art to use an excimer laser emitting at 193 nm, as recited in the above claims.

C. Combination 3; reference 3 combined with either reference 5 or reference 6, and with what is well known in the art.

Claims 24, 25, 27-29, 32, 34-36, 39-45, 69, 71, 72, 75-78, 80, 82-86, 89-91, 93, 94, 97-98 are obvious in view of combination 3: reference 3 combined with either reference 5 or reference 6, and with what is well known in the art.

Reference 3 teaches all the limitations of the above claims except for (1) a no greater than 1 mm spot size of the laser beam on the cornea, (2) a no greater than 10 mJ energy level of the laser pulse at the output coupler of the laser, and (3) a 0.05 to 0.5 μm of removed tissue per pulse.

However, reference 5 and reference 6 teach that a "useful" spot size on the cornea is 0.5 mm. See reference 5 at column 4, lines 13-15; and reference 6 at column 4, lines 7-9. It would have been obvious to a person of ordinary skill in the art to apply a 0.5 mm spot size in the method taught by reference 3 because such spot size is "useful" for ablating corneas, as taught in references 5 and 6.

With respect to the energy level of the laser pulse at the output coupler of the laser, it is well known in the art that the threshold for ablating corneal tissue with a wavelength of 193 nm is about 50 mJ/cm^2, and that the preferred fluence is about 100 to 250 mJ/cm^2. See for example reference 7, column 7, lines 17-45. Therefore, it is obvious to use a laser outputting a laser beam with a fluency of 100 mJ/cm^2. Furthermore and as noted above, it is obvious to use a relatively small size spot on the cornea, for example a 0.5 mm spot size, i.e. a 2.5×10^{-3} cm^2 area. Consequently, it is obvious to use a laser outputting a laser beam with

an energy (fluence times area) equal to 100 mJ/cm^2 (fluence) times 2.5×10^{-3} cm^2 (area), i.e. 0.25 mJ, which is no greater than 10 mJ, as claimed. The motivation for such an energy level is provided by the fact that the claimed energy level would be sufficient to ablate corneal tissue and that reference 3 states that the laser beam intensity is set so that the laser beam has "an intensity suitable for ablating a surface of cornea of an eye." See reference 3, for example claim 3.

Regarding the claimed corneal tissue removal rate, it is well known that a typical corneal ablation rate is about 0.1 to 1 μm per pulse, which overlaps the claimed range. See for example reference 7 at column 7, lines 46-47, stating that "[t]ypically, a single pulse will erode a depth in the range 0.1 to 1 micrometer of collagen from the cornea."

D. **Combination 4; combination 3 combined with reference 2.**

Claims 48, 50, 51, 55-60, 62-64, 81, 87 and 88 are obvious in view of combination 4: combination 3 combined with reference 2.

Combination 3 teaches all the limitations of the above claims except for a galvanometer. However, combination 3 teaches a scanner configured to scan the laser beam over the cornea and reference 2 teaches a galvanometer for controlling the scanning of a laser used for ophthalmic examinations (see figure 1 and column 5, lines 45-61). Furthermore, reference 2 teaches that the galvanometer allows a controlled X-Y scanning. See column 5, lines 45-61. It would have been obvious for one of ordinary skill in the art to control the laser scanning as taught in combination 3 using a galvanometer as taught in reference 2 in order to provide a controlled X-Y scanning of the laser beam on the lens.

E. **Combination 5; reference 4 combined with either reference 5 or reference 6, and with what is well known in the art.**

Claims 24, 25, 27-29, 32-47, 69, 71-80, 82-86, 89-94, 96-98 are obvious in view of combination 5: reference 4 combined with either reference 5 or reference 6, and with what is well known in the art.

Reference 4 teaches all the limitations of the above claims except for (1) a repetition rate of at least 20 Hz, (2) a no greater than 1 mm spot size of the laser beam on the cornea, (3) a no greater than 10 mJ energy level of the laser pulse at the output coupler of the laser, and (4) a 0.05 to 0.5 μm of removed tissue per pulse.

Regarding the claimed repetition rate, such repetition rates are well known in the art, for example, both references 5 and 6 disclose a 200 Hz repetition rate for an excimer laser (see reference 5, column 4, line 5 and reference 6, column 3, line 68). Furthermore,

reference 4 states that "[i]t is possible to modify the current scanning slit delivery system to reduce the time required for most surgical procedures . . . by . . . increasing the laser repetition rate." See page 395, 1st column, lines 4-10. Consequently, it would be obvious to use a 200 Hz repetition rate in the method disclosed in reference 4 because it would reduced the time required for the surgical procedure.

With respect to the spot size, reference 5 and reference 6 teach that a "useful" spot size on the cornea is 0.5 mm. See reference 5 at column 4, lines 13-15; and reference 6 at column 4, lines 7-9. It would be obvious to a person of ordinary skill in the art to apply a 0.5 mm spot size in the method taught by reference 4 because such spot size is "useful" for ablating corneas, as taught in references 5 and 6, and because reference 4 states that "[t]he principle of this delivery system involves irradiating only a small area of the cornea at one time." See page 394, 2nd column, last 4 lines.

Regarding the energy level of the laser pulse at the output coupler of the laser, it is well known in the art that the threshold for ablating corneal tissue with a wavelength of 193 nm is about 50 mJ/cm^2, and that the preferred fluence is about 100 to 250 mJ/cm^2. See for example reference 7, column 7, lines 17-45. Therefore, it is obvious to use a laser outputting a laser beam with a fluency of 100 mJ/cm^2. Furthermore and as noted above, it is obvious to use a relatively small size spot on the cornea, for example a 0.5 mm spot size, i.e. a 2.5×10^{-3} cm^2 area. Consequently, it is obvious to use a laser outputting a laser beam with an energy (fluence times area) equal to 100 mJ/cm^2 (fluence) times 2.5×10^{-3} cm^2 (area), i.e. 0.25 mJ, which is no greater than 10 mJ, as claimed. The motivation for such an energy level is provided by the fact that the claimed energy level would be sufficient to ablate corneal tissue and that the object of the method disclosed in reference 4 is ablation of the cornea.

With respect to the claimed corneal tissue removal rate, it is well known that a typical corneal ablation rate is about 0.1 to 1 µm per pulse, which overlaps the claimed range. See for example reference 7 at column 7, lines 46-47, stating that "[t]ypically, a single pulse will erode a depth in the range 0.1 to 1 micrometer of collagen from the cornea." Furthermore, Ref. 4 states that "[t]he maximum surface uniformity will be obtained when the smallest amount of corneal tissue is removed with each pulse." See page 394, 2nd column, last full paragraph. Consequently, it would be obvious to ablate only 0.05 to 0.5 µm of tissue per pulse because such ablation rate would increase the surface uniformity.

F. **Combination 6; combination 4 combined with reference 2.**

Claims 48, 50, 51, 53-60, 62-68, 81, 87 and 88 are obvious in view of combination 6: combination 5 combined with reference 2.

Combination 5 teaches all the limitations of the above claims except for a galvanometer. However, combination 5 teaches a scanner configured to scan the laser beam over the cornea and reference 2 teaches a galvanometer for controlling the scanning of a laser

used for ophthalmic examinations (see figure 1 and column 5, lines 45-61). Furthermore, reference 2 teaches that the galvanometer allows a controlled X-Y scanning. See column 5, lines 45-61. It would have been obvious for one of ordinary skill in the art to control the laser scanning as taught in combination 5 using a galvanometer as taught in reference 2 in order to provide a controlled X-Y scanning of the laser beam on the lens.

IV. Relevant Teachings Provided by Each Prior Art Reference

Relevant prior art and their relevant teachings are identified below.

REF. NO.	REFERENCE (102 date)	RELEVANT TEACHING
1	US 4,538,608 to L'Esperance: "Method and Apparatus for Removing Cataractous Lens Tissue" 102(b) date September 3, 1985. Non-ANTEDATABLE against parent application Non-ANTEDATABLE against CIP	Teaches: A method for performing ophthalmic surgery. See abstract. A method and apparatus for ablating tissue using a laser. See column 1, lines 63-66; column 3, lines 7-13. Applying a laser beam onto the cornea. See column 1, lines 56-58; column 2, lines 41-44 and Fig. 1 (number 15 corresponds to the cornea in Fig. 1). Pulsing a laser beam at a repetition rate from about 20 Hz to about 500 Hz. See column 2, lines 67-68; and column 3, lines 20-22. Scanning the laser beam in a substantially overlapping pattern on the cornea. See column 5, lines 18-38 inherently teaching overlapping because the laser beam is applied on the cornea more than once over the same scanning patterns. A laser beam with an energy of about 1 to about 30 millijoules per pulse. See column 3, lines 1-2.
1	Continued	An near-infrared laser beam. See column 2, lines 67-68. An ultraviolet laser beam. See column 3, lines 7-8. A frequency-quadrupled neodymium Yag ultraviolet laser beam. See column 3, lines 8-10.
1	Continued	A neodymium-YAG laser. See Column 3, line 1. An excimer laser. See column 3, lines 7-9.

1	Continued	Scanning in a circular pattern. See column 5, lines 18-20 and fig. 3. A scanner configured to scan the laser beam over the cornea. See column 3, lines 63-68 and figure 2. A visible aiming device to guide the laser beam. See column 4, lines 3-4, and 31-32 and figure 1.

2	United States patent No. 4,838,679 to Bille: "Apparatus for, and method of, examining eyes" 102(b) date June 13, 1989. Non-ANTEDATABLE against parent application Non-ANTEDATABLE against CIP	Teaches a laser scanning mechanism including a galvanometer with pivotal mirrors configured to deflect the laser beam at predetermined angles. See figure 1 and column 5, lines 45-61.

3	United States patent No. 5,507,799 to Sumiya: "Ablation apparatus for ablating an object by laser beam" 102(b) date April 16, 1996. 102(e) date December 24, 1991. ANTEDATABLE against parent application ANTEDATABLE against CIP	Teaches: A method and apparatus for performing ophthalmic surgery. See abstract and column 1, lines 18-20. A method and apparatus for ablating a cornea using a laser. See abstract and column 1, lines 18-20 and column 4, lines 1-8 with Fig. 1. An adjustable laser beam output power to adjust the laser beam intensity and ablation rate. See column 4, lines 60-63. The laser beam power is set so that the laser beam has "an intensity suitable for ablating a surface of cornea of an eye." See claim 3.

3	Continued	A laser beam repetition rate of "about 20 to 50 Hz." See column 5, lines 50-54. Substantial overlapping of the scanning patterns and of consecutive laser beam pulses. See column 5, lines 6-27 with figures 3-5. An ultraviolet laser beam. See claim 5. An excimer laser, see column 4, lines 2-3.
3	Continued	A computer control, see column 4, lines 39-40. Synchronization of the laser pulses and the laser beam scanning. See column 4, lines 44-56; column 5, lines 32-39. A smooth ablation as a result of overlapping consecutive pulses. Column 5, lines 25-33 with Figs. 5(a-e).

4	Hanna et al "Scanning Slit Delivery System" J Cataract Refract Surg, Vol 15, July 1989. 102(b) date April 1989. NON-ANTEDATABLE against parent application NON-ANTEDATABLE against CIP	Teaches: A method and apparatus for performing ophthalmic surgery. See abstract. A method and apparatus for ablating a cornea using a laser. See abstract. An excimer laser. See abstract. A laser beam at 193 nm. See abstract (argon fluoride excimer laser). Computer controlled scanner. See page 390, 2nd column, lines 1-4. "The location of each laser pulse passing through the slit is under the control of a computer program," inherently teaching synchronization between the scanning and the pulsing of the laser beam. See page 392, 2nd column, last full paragraph.

4	Continued	Linear scans. See page 391, 2nd column, lines 1-4. Circular scans. See figure 4. Concentric circles scans. See figure 4. Beam deflected by mirrors. See page 392, 1st column, lines 7-10. An alignment device comprising a helium neon laser. See page 392, 1st column , last paragraph.
4	Continued	An overlapping slit pattern with the "amount of overlapping of each ablation is programmed by the surgeon." See page 392, 2nd column, last full paragraph. "The maximum surface uniformity will be obtained when the smallest amount of corneal tissue is removed with each pulse." See page 394, 2nd column, last full paragraph. "The principle of this delivery system involves irradiating only a small area of the cornea at one time." See page 394, 2nd column, last 4 lines. "It is possible to modify the current scanning slit delivery system to reduce the time required for most surgical procedures . . . by . . . increasing the laser repetition rate." See page 395, 1st column, lines 4-10.

5	US 4,718,418 to L'Esperance: "Apparatus for Ophthalmological Surgery" 102(b) date January 12, 1988. Non-ANTEDATABLE against parent application Non-ANTEDATABLE against CIP	Teaches a scanning laser emitting in the ultraviolet range to achieve controlled ablative photodecomposition of regions of the cornea. See abstract. The scanning is controlled to correct myopic and hyperopic conditions, astigmatism and to perform incisions of a radial or other keratotomy. See column 2, lines 30-43. Teaches using lasers emitting UV radiation. See column 3, lines 59-60.

5	Continued	Teaches gas-lasers such as xenon-fluoride (351 nm), nitrogen (337 nm), xenon-chloride (308 nm), krypton-fluoride (248 nm), argon-fluoride (193 nm), and fluorine (157 nm) lasers can be used. See column 3, lines 61-64. Teaches that other lasers, including crystal lasers, provide further alternative sources. See column 3, lines 65-68. Figs. 3 and 4 show linear and circular scans respectively. These scans are performed by repetitively pulsing a laser beam spot on the surface of the eye. See column 4, lines 21-29.
5	Continued	Overlapping is inherent to obtain the desired results. For example, the cornea is scanned with 25 overlapping scans. See column 5, lines 2-10. See also claim 1, last 3 lines, reciting a plurality of overlapping scans.
5	Continued	Teaches a method to ablate the cornea of a patient to enhance the patient's comfort. See column 9, lines 1-8. If the cornea was not smooth to some degree, the patient's comfort would not be improved. Therefore, reference 3 inherently teaches achieving a smooth ablation of the corneal tissue. "The delineation can be to the surgeon's desired boundary contours, and the scan speed and direction may be programmed." Reference 2 is therefore teaching a computer controlled (programmed) scanning. See column 4, lines 36-39.30-33. See also figure 13 showing a microprocessor coupled to the scanner.
5	Continued	The maximum energy/pulse used is 200 mJ, the pulse repetition is 200 Hz, "it being noted that full rated power is not necessarily required in use of the present invention." See column 4, lines 5-11. "Irradiated flux density and exposure time are so controlled as to achieve desired depth of the ablation . . the scanning action is coordinated to achieve desired ultimate surface change in the cornea." See abstract.

5	Continued	Teaches typical pulse duration of 15 ns. See column 4, line 11. Teaches focusing the laser beam on the surface of the eye. See column 4, lines 13-15. Teaches a typical spot size of 0.5 mm. See column 4, lines 13-15. Teaches circular scan patterns. See column 6, lines 2-6. Teaches concentric circle scan patterns. See column 9, lines 40-52. Figure 10 shows radial scan patterns. See column 6, lines 22-28. Teaches a laser-pumped laser. See column 7, lines 9-13.

6	US 4,665,913 to L'Esperance: "Apparatus for Ophthalmological Surgery" 102(b) date May 19, 1987. Non-ANTEDATABLE against parent application Non-ANTEDATABLE against CIP	Teaches a scanning laser emitting in the ultraviolet range to achieve controlled ablative photodecomposition of regions of the cornea. See abstract. The scanning is controlled to correct myopic and hyperopic conditions, astigmatism and to perform incisions of a radial or other keratotomy. See column 2, lines 24-38. Teaches using lasers emitting UV radiation. See abstract and column 3, lines 53-54. Teaches gas-lasers such as xenon-fluoride (351 nm), nitrogen (337 nm), xenon-chloride (308 nm), krypton-fluoride (248 nm), argon-fluoride (193 nm), and fluorine (157 nm) lasers can be used. See column 3, lines 55-58. Teaches that other laser, including crystal lasers, provide further alternative sources. See column 3, lines 60-62.

6	Continued	Figs. 3 and 4 show linear and circular scans respectively. These scans are performed by repetitively pulsing a laser beam spot on the surface of the eye. See column 4, lines 15-23. Overlapping is inherent to obtain the desired results. For example, The cornea is scanned with 25 overlapping scans. See column 4, line 64 to column 5, line 4. See column 5, lines 2-10. See also claim 1, last 3 lines, reciting a plurality of overlapping scans.
6	Continued	Teaches a method to ablate the cornea of a patient to enhance the patient's comfort. See column 9, lines 1-8. If the cornea was not smooth to some degree, the patient's comfort would not be improved. Therefore, reference 3 inherently teaches achieving a smooth ablation of the corneal tissue. "The delineation can be to the surgeon's desired boundary contours, and the scan speed and direction may be programmed or manually controlled." Reference 2 is therefore teaching a computer controlled (programmed) scanning. See column 4, lines 30-33. See also fig. 13 showing a microprocessor coupled to the scanner.
6	Continued	The maximum energy/pulse used is 200 mJ, the pulse repetition is 200 Hz, "it being noted that full rated power is not necessarily required in use of the present invention." See column 3, lines 63 to column 4, line 5. "Irradiated flux density and exposure time are so controlled as to achieve desired depth of the ablation . . the scanning action is coordinated to achieve desired ultimate surface change in the cornea." See abstract.
6	Continued	Teaches typical pulse duration of 15 ns. See column 4, line 5. Teaches a typical spot size of 0.5 mm. See column 4, lines 7-9. Teaches circular scan patterns. See column 5, lines 64-69.

6	Continued	Teaches concentric circle scan patterns. See column 9, lines 34-46. Fig. 10 shows radial scan patterns. See column 6, lines 16-19. Teaches a laser-pumped laser. See column 7, lines 3-7.

7	United States patent No. 4,941,093 to Marshall et al: "Surface Erosion Using Lasers" 102(b) date July 10, 1990. Non-ANTEDATABLE against parent application Non-ANTEDATABLE against CIP	Teaches: The threshold value for cornea ablation at a wavelength of 193 nm is about 50 mJ per cm^2. See column 7, lines 17-27. "When eroding the cornea at a wavelength of 193 nm . . ., it is preferable to provide to the cornea pulses of an energy density of 100 to 150 mJ per cm^2 per pulse." See column 7, lines 41-45. "Typically, a single pulse will erode a depth in the range 0.1 to 1 micrometer of collagen from the cornea." See column 7, lines 46-47.

8	United States patent No. 5,152,759 to Parel et al: "Noncontact Laser Microsurgical Apparatus" 102(b) date October 6, 1992. 102(e) date June 7, 1989. ANTEDATABLE against parent application ANTEDATABLE against CIP	Teaches: A method for performing heat-shrinking of corneal tissue with a laser beam, i.e. photocoagulation. See column 11, lines 1-15. Providing an infrared laser with a wavelength of about 1.3-3.3 μm. See column 3, lines 6-8. A Nd:YAG laser emitting at a wavelength of 1.3-3.3 μm. See column 5, lines 13-14. Applying an infrared laser beam on corneal tissue. See abstract and column 3, lines 6-8. Scanning a laser beam on the cornea. See column 8, line 61 to column 9, line 11, with corresponding Figures 8-9, teaching moving "continuously" the laser beam projection means so as to scan the cornea with the laser beam "from points 'C' toward points 'D'."

V. Claim Charts Correspondence Corresponding Anticipated Claims to the Prior Art

This section corresponds the recitations in the Lin reissue application anticipated claims in the left hand column to the teachings in the prior art in the right hand column.

A. Claim Chart V-A: Reference 1

Claims 24, 25, 27, 34, 37, 39, 42, 43, 46, 69, 71, 75, 91 and 93 are anticipated by reference 1: US 4,538,608 to L'Esperance: "Method and Apparatus for Removing Cataractous Lens Tissue."

24. A method for performing ophthalmic surgery, comprising:	Reference 1 teaches a method of performing ophthalmic surgery. See abstract.
providing a laser outputting a pulsed laser beam having a repetition rate of at least 20 Hz, and an energy level of no greater than 10 mJ per pulse from an output coupler of said laser;	Reference 1 teaches a laser beam with a repetition rate from about 20 Hz to about 500 Hz. See column 2, lines 67-68; and column 3, lines 20-22. Reference 1 teaches a laser beam with an energy of about 1 to about 30 millijoules per pulse. See column 3, lines 1-2.
applying said laser beam onto corneal tissue; and	Reference 1 teaches applying a laser beam onto the cornea. See column 1, lines 56-58; column 2, lines 41-44 and Fig. 1 (15 is the cornea).
scanning said pulsed laser beam in a substantially overlapping pattern on said corneal tissue.	Substantially overlapping is inherent in reference 1: the laser beam is applied on the cornea more than once over the same scanning patterns. See column 5, lines 18-38.
25. The method for performing ophthalmic surgery according to Claim 24, wherein:	See claim 24.
said pulsed laser beam has a repetition rate of at least 50 Hz.	Ref. 1 teaches a laser beam with a repetition rate from about 20 Hz to about 500 Hz. See column 2, lines 67-68; and column 3, lines 20-22.

27. The method for performing ophthalmic surgery according to Claim 24, wherein:	See claim 24.
said laser beam has an ultraviolet wavelength.	Reference 1 teaches an ultraviolet laser beam. See column 3, lines 7-8.
34. The method for performing ophthalmic surgery according to Claim 24, wherein:	See claim 24.
said pulsed laser beam has a repetition rate in the range of 50 Hz to 200 Hz.	Reference 1 teaches a laser beam with a repetition rate from about 20 Hz to about 500 Hz. See column 2, lines 67-68; and column 3, lines 20-22.
37. The method for performing ophthalmic surgery according to claim 24, wherein:	See claim 24.
said pulsed laser beam is scanned in circular patterns.	Reference 1. teaches scanning in circular patterns. See column 5, lines 18-20.
39. A method for performing ophthalmic surgery, comprising:	Reference 1 teaches a method of performing ophthalmic surgery. See abstract.
providing a laser outputting a pulsed laser beam having an energy level of no greater than 10 mJ per pulse from an output coupler of said laser; and	Reference 1 teaches a pulsed laser beam with an energy of about 1 to about 30 millijoules per pulse. See column 3, lines 1-2.
scanning said pulsed laser beam in a substantially overlapping pattern on corneal tissue.	Substantially overlapping is inherent in reference 1: the laser beam is applied on the cornea more than once over the same scanning patterns. See column 5, lines 18-38.
42. The method for performing ophthalmic surgery according to Claim 39, wherein:	See claim 39.
said pulsed laser beam is pulsed at a repetition rate of at least 20 Hz.	Reference 1 teaches a laser beam at a repetition rate from about 20 Hz to about 500 Hz. See column 2, lines 67-68; and column 3, lines 20-22.
43. The method for performing ophthalmic surgery according to Claim 39, wherein:	See claim 39.
said pulsed laser beam is pulsed at a repetition rate of at least 50 Hz.	Reference 1 teaches a laser beam at a repetition rate from about 20 Hz to about 500 Hz. See column 2, lines 67-68; and column 3, lines 20-22.

46. The method for performing ophthalmic surgery according to claim 39, wherein:	See claim 39.
said pulsed laser beam is scanned in circular patterns.	Reference 1. teaches scanning in circular patterns. See column 5, lines 18-20.
69. An apparatus for ablating tissue, comprising:	A method and apparatus for ablating tissue using a laser. See column 1, lines 63-66; column 3, lines 7-13.
a laser adapted to emit a pulsed output beam having an ultraviolet wavelength and a repetition rate of at least 50 Hz; and	Reference 1 teaches an ultraviolet laser beam. See column 3, lines 7-8. Reference 1 teaches a laser beam at a repetition rate from about 20 Hz to about 500 Hz. See column 2, lines 67-68; and column 3, lines 20-22.
a scanner constructed and arranged to control said pulsed output beam into a substantially overlapping pattern of beam pulses on said tissue.	Reference 1 teaches a scanner configured to scan the laser beam over the cornea. See column 3, lines 63-68 and Fig. 2. Substantially overlapping is inherent in ref. 1: the laser beam is applied on the cornea more than once over the same scanning patterns. See column 5, lines 18-38.
71. The apparatus for ablating tissue according to claim 69, wherein:	See claim 69.
said pulsed output beam has an energy level no greater than 10 mJ per pulse.	Reference 1 teaches a laser beam with an energy of about 1 to about 30 millijoules per pulse. See column 3, lines 1-2.
75. The apparatus for ablating tissue according to claim 69, wherein:	See claim 69.
said laser is an excimer laser.	Reference 1 teaches an excimer laser. See column 3, lines 7-9
91. A method for performing ophthalmic surgery, comprising:	Reference 1 teaches methods for performing ophthalmic surgery. See abstract.

pulsing an ultraviolet laser beam having an output energy level of no greater than 10 mJ per pulse from an output coupler of said laser;	Reference 1 teaches a puling laser beam. See column 2, lines 67-68; and column 3, lines 20-22. Reference 1 teaches an ultraviolet laser beam. See column 3, lines 7-8. Reference 1 teaches a laser beam with an energy of about 1 to about 30 millijoules per pulse. See column 3, lines 1-2.
applying said pulsing ultraviolet laser beam onto corneal tissue; and	Reference 1 teaches applying a laser beam onto the cornea. See column 1, lines 56-58; column 2, lines 40-42 and Fig. 1 (15 is the cornea).
scanning said pulsing laser beam in a purposefully substantial overlapping pattern on said corneal tissue.	Substantially overlapping is inherent in ref. 1: the laser beam is applied on the cornea more than once over the same scanning patterns. See column 5, lines 18-38.
93. The method of performing ophthalmic surgery according to claim 91, wherein:	See claim 91.
said pulsing ultraviolet laser beam is pulsed at a repetition rate of at least 50 Hz.	Reference 1 teaches a laser beam at a repetition rate from about 20 Hz to about 500 Hz. See column 2, lines 67-68; and column 3, lines 20-22.

B. **Claim Chart V-B: Reference 8**

Claims 99-103 are anticipated by Reference 8: US 5,152,759 to Parel et al: "Noncontact laser microsurgical apparatus."

99. A method for performing photocoagulation on corneal a corneal surface, comprising:	Reference 8 teaches a method for performing heat-shrinking of corneal tissue with a laser beam, i.e. photocoagulation. See column 11, lines 1-15.
providing an infrared laser beam;	Reference 8 teaches an infrared laser with a wavelength of about 1.3-3.3 μm. See column 3, lines 6-8.

applying said infrared laser beam onto corneal tissue; and	Reference 8 teaches applying an infrared laser beam on corneal tissue. See abstract and column 3, lines 6-8.
scanning said infrared pulsed laser beam in a pattern to photocoagulate corneal tissue.	Reference 8 teaches scanning a laser beam on the cornea. See column 8, lines 61 to column 9, line 11, with corresponding figures 8-9, teaching moving "continuously" the laser beam projection means so as to scan the cornea with the laser beam "from points 'C' toward points 'D'."
100. A method for performing photocoagulation on corneal surface according to Claim 99, wherein:	See claim 99.
said infrared laser beam is emitted by a diode laser having a wavelength in a range of 1.54 to 2.5 µm.	Reference 8 teaches a Nd:YAG laser emitting at a wavelength of 1.3-3.3 µm. See column 5, lines 13-14.
101. A method for performing photocoagulation on corneal surface according to Claim 100, wherein:	See claim 100.
said infrared laser beam is emitted by a diode laser having a wavelength in a range of 1.9 to 2.5 µm.	Reference 8 teaches a Nd:YAG laser emitting at a wavelength of 1.3-3.3 µm. See column 5, lines 13-14.
102. A method for performing photocoagulation on corneal surface according to Claim 100, wherein:	See claim 100.
said infrared laser beam is emitted by a diode laser having a wavelength 2.1 µm.	Reference 8 teaches a Nd:YAG laser emitting at a wavelength of 1.3-3.3 µm. See column 5, lines 13-14.
103. A method for performing photocoagulation on corneal surface according to Claim 100, wherein:	See claim 100.
said infrared laser beam is emitted by a diode laser having a wavelength 1.54 µm.	Reference 8 teaches a Nd:YAG laser emitting at a wavelength of 1.3-3.3 µm. See column 5, lines 13-14.